DOCKET FILE COPY ORIGINAL

PIPER & MARBURY
L.L.P.
1200 NINETEENTH STREET, N.W.
WASHINGTON, D.C. 20036-2430
202-861-3900
FAX: 202-223-2085

BALTIMORE
NEW YORK
PHILADELPHIA
EASTON

WRITER'S DIRECT DIAL
(202) 861-3864

March 24, 1997

RECEIVED

MAR 24 1997

Federal Communications Commission
Office of Secretary

HAND DELIVERY

William F. Caton
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

Re: In the Matter of Access Charge Reform (CC Docket No. 96-262); Price Cap Performance for Local Exchange Carriers (CC Docket No. 94-1); Transport Rate Structure and Pricing (CC Docket No. 91-213); Usage of the PSN by Information and Internet Access Providers (CC Docket No. 96-263)

Dear Mr. Caton:

Enclosed for filing are an original and sixteen copies of the Comments of DSC Communications Corporation in the above-referenced matter. We have also provided copies of this filing to the Competitive Pricing Division of the Common Carrier Bureau. Also enclosed is a copy on diskette in MS Word 2.0 format.

If there are any questions about this filing, please call me.

Sincerely,

John E. Benedict

Enclosures

No. of Copies rec'd 0+15
List ABCDE

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Access Charge Reform	)	CC Docket No. 96-262
	)	
Price Cap Performance for Local Exchange Carriers	)	CC Docket No. 94-1
	)	
Transport Rate Structure and Pricing	)	CC Docket No. 91-213
	)	
Usage of the Public Switched Network by Information Service and Internet Access Providers	)	CC Docket No. 96-263
	)	

COMMENTS ON NOTICE OF INQUIRY OF DSC COMMUNICATIONS CORPORATION

DSC Communications Corporation ("DSC"),[1] by its attorneys, hereby submits its Comments in the above-captioned Notice of Inquiry ("NOI").

---

[1] DSC is a publicly traded, Texas-based leading designer, developer, manufacturer and marketer of digital, switching, access, transmission and private network systems products. DSC's products are utilized by six of the Regional Bell Companies, MCI, several independent telephone companies and numerous U.S. interexchange carriers. In addition, DSC equipment is in use by telecommunications carriers today in over 50 nations around the world.

I. INTRODUCTION

DSC joins those concerns "now being raised about switch congestion caused by Internet usage."[2] DSC believes that the local exchange companies have a valid point that Internet calls are continuing to escalate network costs while degrading service quality. In particular, DSC recognizes that the explosive and continued Internet growth presents significant challenges to local exchange carrier ("LEC") networks due to inherent long call holding times, which were not originally contemplated. With congestion on the increase, due in part to the "new" fixed monthly rates charged to subscribers by the Internet Service Providers ("ISPs") along with the current low price of personal computers, network performance quality impairments are becoming widespread, particularly during inclement weather days when evening Internet traffic is shifted and combined with day traffic. Specifically, when an Enhanced Service Provider's ("ESP")[3] traffic exceeds engineered switch and network trunking arrangements, call denial often occurs, with Internet and non-Internet callers experiencing no dial tone, slow dial tone, and all trunks busy signals indicating that network quality has degraded.

Evidence of this growing concern over congestion can be seen in the comments made by Bell Atlantic to the FCC stating specifically that, "service interruptions of even a temporary length could affect public safety services such as 911 service, with unthinkable consequences."[4] In addition, as Michael Fitzpatrick, President and CEO, Pacific Telesis Enterprises, also commented at Wescon/96: "[l]ast year's [1995] big story was the Gold Rush of Net Commerce.

---

[2]NOI, ¶ 313

[3]ESPs include both ISPs and data service providers.

[4]See Report of Bell Atlantic on Internet Traffic (submitted to the FCC March 1996).

This year [1996] it's 'Meltdown: The Internet in Crisis.'"[5] According to Fitzpatrick, Pacific Bell selected 11 switches in neighborhoods where the Internet is booming, and measured them carefully for 13 days. Pacific Bell saw great congestion with just 3 percent of the lines doing 30 percent of the traffic. They also saw one in 6 calls fail. Other Pacific Bell customers suffered a dip in service quality because of Internet calls.[6] Thus, while the public network may not actually meltdown, the trend lines are certainly heading the wrong direction.

II. DISCUSSION

A. The Development of the DSC Intelligent Internet Solution

In order to combat the congestion and in response to the Commission's invitation to "identify means of addressing the congestion concerns raised by incumbent LECs,"[7] DSC has developed what it calls the Intelligent Internet Solution ("IIS"). DSC believes that the best solution to reduce Network congestion is to take data calls off the public switch telephone network ("PSTN") and restore service quality and costs models for universal voice services. This approach should not be technically burdensome to either the subscriber, telephone company, or the ESP. Further, DSC's network economic modeling indicates that the LECs should experience a reduction in their capital costs with the benefit of developing a long term infrastructure to support the ongoing growth of long hold time data traffic. Thus, when DSC started to architect the IIS, it felt that it needed a long term view which looked at other telecommunications network trends to help answer key questions.

---

[5] Internet Congestion: Crisis or Come On?, keynote address by Michael Fitzpatrick at Wescon/96 (Oct. 23, 1996).

[6] *Id.*

[7] NOI, ¶ 313.

In particular, DSC considered the fact that virtually all public telephone network calls use SS7 signaling now.[8] According to DSC's analysis during the development of its IIS, SS7 has proven itself to be flexible, reliable, and robust. The technology continues to grow to support exciting new requirements, including government mandated unbundling. DSC, therefore, concluded that the SS7 network should play a vital part in the solution, with its inherent intelligence to uniformly recognize calls to ESPs coupled with the ability to redirect the call. In addition, the use of the SS7 network provides DSC with the added benefits of being able to redirect Internet calls on tandem switches to reduce congestion on a broader network-wide scale and build the solution similar to current network high usage and final trunking engineering principles.

As part of its goals in the creation of its IIS, DSC developed IIS as a package of network solutions that offer immediate short term congestion relief for near term solutions which provide cost effective call redirection and optimize the reduction and transport of calls to ESPs, and long term solutions focused on enhancing Internet service performance. DSC, therefore, recommends the following multi-phase treatment plan: (1) to improve routing flexibility to limit the effects Internet congestion has on regular traffic in near term; (2) to unload Internet calls from PSTN trunks to stabilize network costs and improve service quality in the near to mid term; (3) to redirect Internet calls off the originating end office switch as Internet traffic grows to eliminate switch and PSTN congestion in the mid to long term; (4) to provide dedicated xDSL lines to

---

[8] As defined in the NPRM in the current proceeding, "SS7 is the international standard network protocol currently used to transmit signaling information over common channel signaling (CCS) networks. . . ." NPRM, ¶ 123. In addition, "SS7 networks consist of high-speed packet switches and dedicated circuits that are separate from, but interconnected with, the telecommunications networks over which telephone calls are carried. Incumbent LECs typically use SS7 networks for three purposes: (1) for call setup; (2) to obtain information from remote databases, such as billing information that must be obtained from the line information database (LIDB) to determine whether a calling card is valid; . . . and (3) to transmit the information and instructions necessary to provide custom local area signaling services (CLASS features), such as automatic call back and caller ID." NPRM, ¶ 124.

support more bandwidth and new features, also in the mid to long term; and (5) to build hybrid synchronous transfer mode/asynchronous transfer mode network infrastructure that integrates the best of the PSTN world with the data world.

B. How IIS Works

IIS redirects public network telephone calls destined to ESPs to a data network designed to economically handle the special demands of Internet calls thereby restoring PSTN service quality while providing new services to Internet callers. IIS is based on flexible configurations designed to economically fix Internet congestion at the best, most effective points in the network. DSC's IIS enables carriers to reduce the impact of ESP traffic by "identifying" and "redirecting" Internet and data calls off the switching network by using the power of the SS7 network and routing it to the ESP directly. Transport from IIS to the ESP can be accomplished over a separate dedicated measured data network ("MDN"), packet data network ("PDN") or over standard T1 (D4 or PRI) interfaces.

Based on DSC's extensive review of industry studies and traffic analysis performed by a number of telephone companies, it is apparent to DSC that congestion due to ESP calls in the switching network affects three major areas as represented in Figure 1. See Exhibit A. Congestion normally first occurs at the terminating or egress end office that is the serving point for the ESP. Most ESP's today connect to this switch with large numbers of standard ('1MB' or PRI) lines that typically run above 25 CCS. This places considerable burden on the egress switch's ability to provide normal subscriber services, leading to slow or no dial tone situations. The second point of network congestion is in the trunk network. This is a direct result of the congestion that has been caused at the egress switch. Finally, as Internet subscriber growth continues to increase dramatically, the subscriber's originating or ingress switch will be congested at the line interface units.

The IIS, which is designed to address all points of network congestion, is set forth in Figure 2, highlighting both the trunk redirection and the line redirection capabilities. See Exhibit B. Since a significant number of subscribers today continue to connect via copper lines on the access side of the ingress switch, DSC's IIS provides redirection solutions for any subscriber. Lower volume users can have their ESP calls redirected on the trunk side of the ingress switch or at a tandem (access tandem) switch. This trunk redirection provides congestion relief for the egress switch as well as the trunk network. High end ('data hog') users and DLC-based subscribers can have their ESP calls redirected with line redirection, thus providing relief to the ingress switch congestion.

DSC's Intelligent Internet Solution is based on a strong belief that ESP traffic challenges are real, network wide, and growing at phenomenal rates. Network trunking problems are resolved by redirecting Internet traffic off the trunk network at the trunk side of the originating end office or at a tandem office. Alternate routes exist to the terminating end office through the solution described above and, as a last resort, through the trunk network. Similarly, IIS resolves any subscriber side problems experienced at the ingress end office by redirecting traffic to the data network prior to routing through the class 5 switch. The class 5 switch is used during call set up and released as soon as the connection is complete. Voice traffic is then passed to the Class 5 switch over standard DLC switch interfaces (*i.e.*, TR-57, TR-08, TR-303). Additionally, since IIS gathers data from the SS7 network, it will also provide reports which will help the LEC to identify long hold time users and supply the LECs with the listing of lineside redirect candidates.

Importantly, DSC's solution is based on enhancements to products currently approved and installed in a large number of carrier networks, as opposed to introducing entirely new

products that overlap what's already operational.[9] DSC believes that by avoiding the introduction of many new products or reworking network architectures, lower costs, reduced introduction risks, and improved service quality can be realized.[10]

In summary, the DSC Intelligent Internet Solution positions the carrier to address all forms of subscriber Internet/data traffic including: DLC based subscribers, copper connected subscribers, and high-usage, high bandwidth users. DSC believes that IIS provides economical forward-looking solutions to the Internet congestion problems experienced by the local exchange carriers. The inherent flexibility of applying redirection only at the point of problem occurrence, avoids excessive "over treatment" costs. DSC's Intelligent Internet Solution provides a total network solution that eliminates network congestion caused by the ever increasing Internet/data traffic. This gives carriers a powerful, flexible, and economical method to accomplish their objectives to identify and redirect Internet traffic off the traditional switching network to a separate dedicated network path to the ESP.

---

[9]This includes DSC's widely deployed MegaHub,® Litespan,® and DEXCS product families. The power of the SS7 network is coupled with access (Litespan®), transport (DEXCS and iMTN®), and intelligent network products (MegaHub®) to deliver an effective solution. Using these field proven products reduces the costs, complexity, risk, and time required to engineer and deploy DSC's Intelligent Internet Solution. In particular, the DSC DEXCS product is used for grooming and transport of Internet traffic into the data network. The Litespan,®teamed with the intelligence of the SS7 signaling network through the MegaHub Controller, re-routes the data traffic directly to the alternate routes to the ESP. Call control, monitoring and billing for data calls is provided by the MegaHub Controller.

[10]For example, DSC's current Litespan® deployment can support about 13 + million Internet users today via the PSTN. Litespan® was designed to support more applications than a DLC connecting to an End Office Switch. A simple enhancement will allow these users to be redirected off the PSTN. Further, the xDSL technology we are incorporating into Litespan® will significantly increase the available bandwidth to allow users to receive video clips or download "mega-files" in near real time.

III. CONCLUSION

In its conclusion to the NOI, the Commission "strongly encourage[s] interested parties among incumbent LECs and ESPs to work together to identify which technological solutions hold the greatest promise in carrying Internet traffic most efficiently and with the least adverse price impact on consumers."[11] DSC believes its IIS provides an economical forward-looking solution to the Internet congestion problems experienced by the LECs. Furthermore, DSC suggests that the FCC encourage all LECs to investigate implementing the DSC IIS solution, which provides immediate congestion relief with a smooth transition path to support future network requirements.

Respectfully submitted,

DSC Communications Corporation
by:

Randall B. Lowe
John E. Benedict
Piper & Marbury, L.L.P.
1200 19th Street, N.W.
Washington, D.C. 20036
(202) 861-3900

Its Attorneys

March 24, 1997

[11] NOI, ¶ 317.

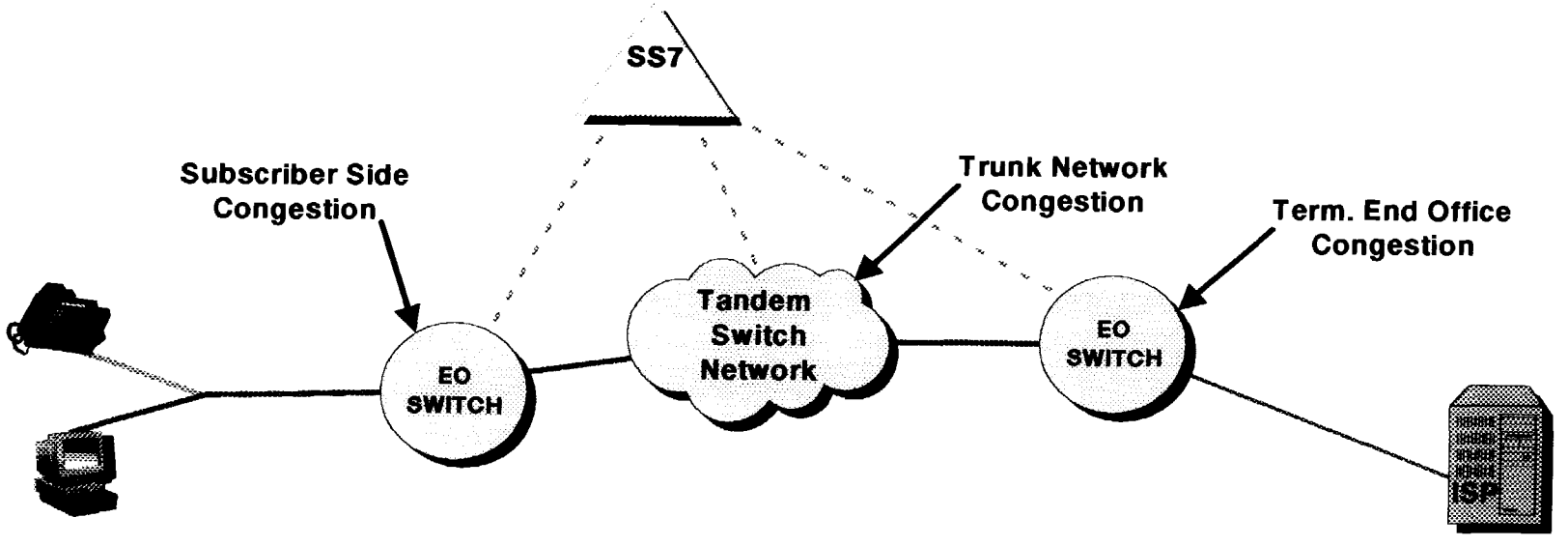

Figure 1 - ISP/DSP Network Congestion Points

B

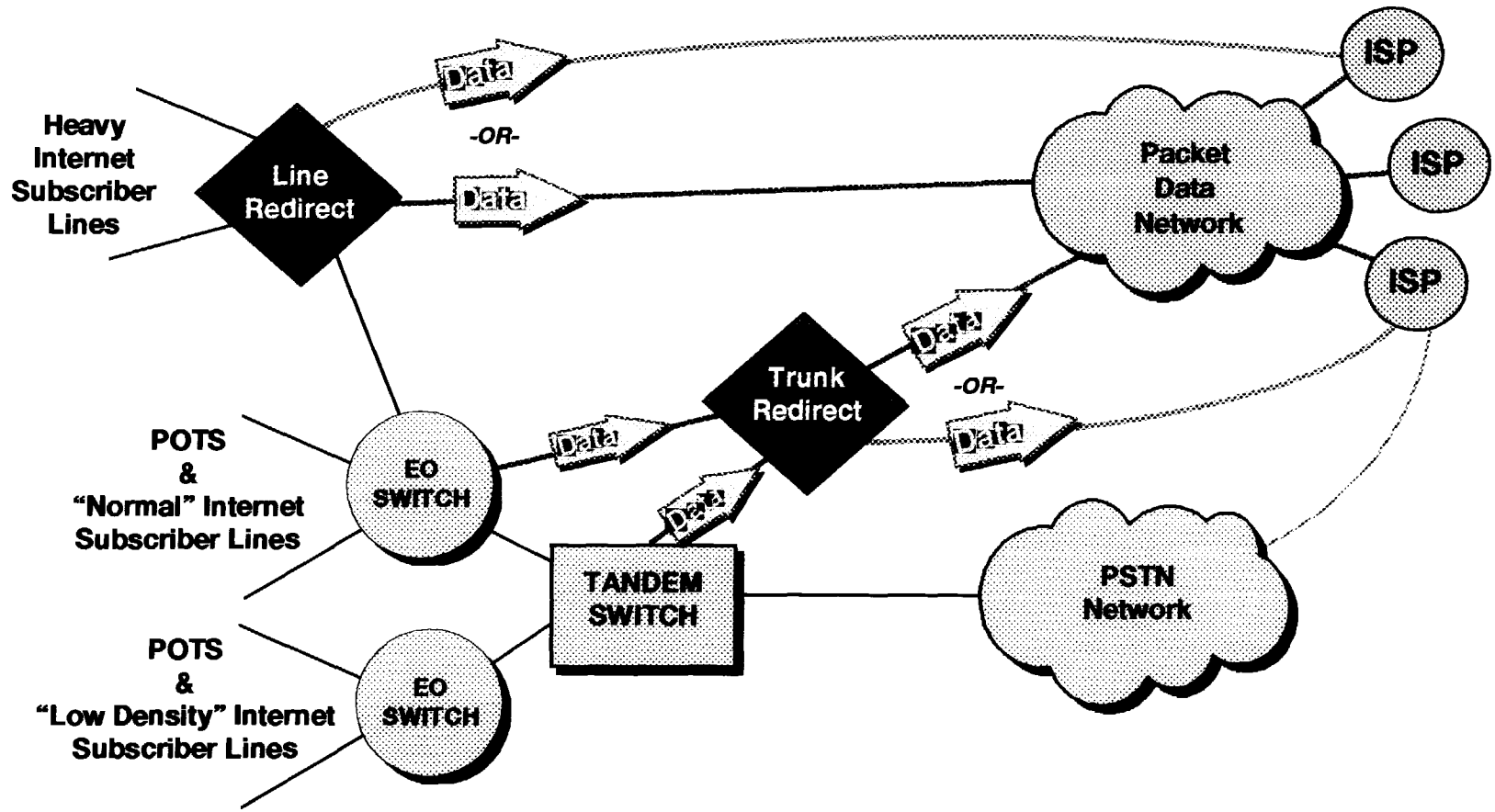

Figure 2 - DSC Intelligent Internet Solution